

Description of a new species of *Oreonectes* (Cypriniformes, Nemacheilidae) from Guangxi, China

Zhuo-Ni Chen^{1,2,3}, Shi-Rong Huang^{1,2}, Tong-Xiang Zou^{1,2}, Li-Na Du^{1,2}, Feng Lin^{3,4}

1 Key Laboratory of Ecology of Rare and Endangered Species and Environmental Protection (Guangxi Normal University), Ministry of Education, Guilin, Guangxi 541004, China

2 Guangxi Key Laboratory of Rare and Endangered Animal Ecology, College of Life Sciences, Guangxi Normal University, Guilin, Guangxi 541004, China

3 Guangxi Academy of Fishery Sciences, Nanning, Guangxi 530021, China

4 Engineering Research Center of Hongshui River Rare Fish Conservation, Guangxi Zhuang Autonomous Region, Nanning, Guangxi, 530021, China

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Corresponding authors: Li-Na Du (dulina@mailbox.gxnu.edu.cn); Feng Lin (linfengmail0409@163.com)

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Abstract

Fishes of the genus *Oreonectes* inhabit complex karst landscapes, and additional cryptic species may be present within *Oreonectes*. Specimens previously identified as *O. platycephalus* and collected from Fenzhan Village, Jinxiu County, Guangxi, may represent a new species, *Oreonectes jinxiuensis*. It is distinguished from all congeners by a degenerated swim bladder, adjacent anterior and posterior nostrils, 13 inner gill rakers on the first gill arch, a dorsal-fin origin posterior to the pelvic-fin origin, 10 branched pectoral-fin rays, 14–15 branched caudal-fin rays, a preanal length of 73.7%–77.3% of SL, and a caudal-peduncle length of 13.3%–16.4% of SL. Its validity is further supported by its recovered monophyly in a molecular phylogenetic analysis based on mitochondrial COI and Cyt *b* gene sequences, as well as by species-level genetic divergence between the new species and its closest relatives.

Key Words

Cryptic species, karst region, mitochondrial gene, *Oreonectes*, taxonomy

Introduction

The species of the genus *Oreonectes* Günther, 1868, are commonly found in the Guangxi Zhuang Autonomous Region (hereinafter abbreviated as Guangxi), Hong Kong, and Guangdong Province of China, as well as in Quang Ninh Province in northern Vietnam (Zhu 1989; Kottelat 2001; Du et al. 2008; Zhong et al. 2024). These species inhabit cold-water environments and are restricted to small subterranean streams and upstream rivers (Lan et al. 2024; Luo et al. 2024). Although the type locality of *O. platycephalus* Günther, 1868, the type species of the genus *Oreonectes*, is documented in Hong Kong, specimens commonly cited in the literature originate from Guangxi, as noted by Zhu and Cao (1987), Zhu (1989), and Du et

al. (2008). *Oreonectes platycephalus* has been reported from multiple localities, including Jinxiu County, Laibin City, Rong'an County, Liuzhou City, Zhaoping County, Hezhou City, Du'an Yao Autonomous County, Hechi City, Mashan County, Nanning City, and Luocheng Mulao Autonomous County, Hechi City, in Guangxi, as well as Luofu and Baiyun mountains in Guangdong (Zhu 1989; Zhou and Zhang 2006; Lan et al. 2024). However, based on molecular evidence, specimens from Luocheng and Mashan counties were identified as other species, namely *O. luochengensis* Yang, Wu, Wei & Yang, 2011b and *O. damingshanensis* Yu, Luo, Lan, Xiao & Zhou, 2023, respectively (Yang et al. 2011b; Yu et al. 2023). To date, 12 valid species of *Oreonectes* have been recognized, including *O. platycephalus* from Hong Kong, Guangxi, and

Guangdong, and *O. yuedongensis* Luo, Lan, Xiao & Zhou, 2024 from Guangdong. The following 10 species have been recorded from Guangxi: *O. polystigmus* Du, Chen & Yang, 2008; *O. guananensis* Yang, Wei, Lan & Yang, 2011a; *O. luochengensis*; *O. guilinensis* Huang, Yang, Wu & Zhao, 2020; *O. damingshanensis*; *O. andongensis* Luo, Yang, Du & Luo, 2024; *O. zhang* Zhong, Yang & Chen, 2024; *O. guidongensis* Luo, Yu, Liao & Zhou, 2025; *O. daguishanensis* Chen, Leng, Yang, Tang & Qiu, 2025a; and *O. qinae* Chen, Mo, Du & Zhang, 2025b.

The genus *Oreonectes* is characterized by a depressed head, a compressed body, adjacent anterior and posterior nostrils, a tube-like base of the anterior nostril with an enlarged, barbel-like tip, and a caudal fin that is truncated or rounded (Günther 1868; Du et al. 2023).

Based on molecular evidence, additional cryptic species may exist within the genus *Oreonectes* (Wang 2022; Yu et al. 2023). Consequently, multiple new species have been described from geographically restricted regions within the past 2 years (Yu et al. 2023; Luo et al. 2024; Zhong et al. 2024; Chen et al. 2025a, b; Liao et al. 2025). This led us to suspect that *O. platycephalus* from Fenzhan Village, Jinxiu County, Guangxi, could represent a novel species. Specimens initially collected from Jinxiu County in 2005 were reexamined, and additional fresh samples were collected in 2024 and 2025. The results of morphological analyses and phylogenetic reconstruction support the hypothesis that the specimens from Jinxiu County represent a new, undescribed species. Therefore, this species is formally described herein.

Materials and methods

Specimens were collected from Jinxiu Town, Yao Autonomous County, Laibin City, Guangxi Zhuang Autonomous Region, China, and are deposited in the Kunming Natural History Museum of Zoology, Kunming Institute of Zoology (KIZ), Chinese Academy of Sciences (CAS). Ten specimens were preserved in 10% formalin, and the preservative was subsequently replaced with 75% ethanol after fixation. Six specimens were preserved in 99% ethanol. All procedures adhered to the Implementation Rules of the Fisheries Law of the People's Republic of China and the Laboratory Animal Guidelines for the Ethical Review of Animal Welfare (GB/T 35892–2018). Measurement and counting methods, as well as descriptions of the head lateral line system, followed Kottelat (1990). Morphological data were measured point-to-point using a vernier caliper with an accuracy of 0.1 mm. Fin rays were examined under a microscope to distinguish individual rays, with the last two rays supported by a shared pterygiophore counted as a single ray. All measurements were taken from the left side of each specimen. Abbreviations used are as follows: SL, standard length; TL, total length; HL, lateral head length.

For the analysis of morphological data, principal component analysis (PCA) was used to explore morphometric

differences (Lan et al. 2024) between the new species and its close congeners, *O. guilinensis* and *O. platycephalus*. PCA was conducted in SPSS v.25.0 (SPSS Inc.), and scatter plots of the scores of the first two principal components were used to examine differentiation between the new species and its closest congeners revealed by phylogenetic analyses.

For molecular analyses to determine the phylogenetic position of the species, the right pelvic fin was clipped from each specimen under aseptic conditions, preserved in 1.5 ml centrifuge tubes containing 99% ethanol, and stored at -20°C . DNA was extracted from ethanol-preserved fin samples using a DNA extraction kit (Sangon Biotech (Shanghai) Co., Ltd., China). Amplification of the mitochondrial COI gene was conducted using primers F14724 (5'-TCAACCAACCACAAAGACATTGGCAC-3') and R15915 (5'-TAGACTTCTGGGTGGCCAAAGAATCA-3') following Ward et al. (2005). Amplification of the cytochrome *b* (Cyt *b*) gene was conducted using primers L14724 (5'-GACTTGAAAAAC-CACCGTTG-3') and H15915 (5'-CTCCGATCTCCG-GATTACAAGAC-3') following Xiao et al. (2001), in a 25 μl PCR reaction system. All primers were purchased from Sangon Biotech (Shanghai) Co., Ltd., China. Sequencing of mitochondrial cytochrome c oxidase subunit I (COI) and cytochrome *b* (Cyt *b*) was performed by Sangon Biotech (Shanghai) Co., Ltd. (China).

Two-way sequence reads were assembled and edited using SeqMan in the Lasergene v7.1.0 package (DNASTAR, Inc., Madison, WI, USA). Uncorrected *p*-distances were calculated based on a concatenated dataset of mitochondrial COI and cytochrome *b* (Cyt *b*) genes using the Kimura 2-parameter (K2P) model with 1000 bootstrap replications in MEGA v7.0 (Kumar et al. 2016). The Cyt *b* sequences used in this study were previously uploaded to GenBank as *O. platycephalus* under accession numbers **MG238231**, **MG238232**, and **JF340409**. An additional 45 sequences were downloaded from GenBank (Table 1). Sequence alignment was performed in MEGA v11.0 (Tamura et al. 2021) using CLUSTAL W (Thompson et al. 1994). The final sequence data were submitted to GenBank (accession nos. **PV817808–PV817810** for COI).

Phylogenetic trees were reconstructed using Bayesian inference (BI) implemented through the CIPRES Science Gateway (Miller et al. 2010) to evaluate the validity of the new species. BI analyses were conducted in MrBayes on XSEDE v3.2.7a (Ronquist et al. 2012), using two independent runs with four Markov chains starting from random trees. The optimal nucleotide substitution model for the concatenated dataset (COI + Cyt *b*) was determined under the AICc criterion using PartitionFinder v2.1.1 and identified as GTR+I+G. Chains were run for seven million generations and sampled every 1000 generations, with the first 25% of sampled trees discarded as burn-in. The remaining trees were used to construct a consensus tree and estimate Bayesian posterior probabilities (BPPs). Phylogenetic trees were visualized and adjusted using FigTree v1.4.4 (Rambaut 2009).

Table 1. Samples examined in this study, with localities, collection dates, voucher information, and GenBank accession numbers for mitochondrial gene markers.

ID	Species	Collection localities (* type localities)	Voucher numbers	GenBank accession numbers	Gene type	References
1	<i>O. jinxiuensis</i> sp. nov.	Fenzhan Village, Jinxiu Town, Yao Autonomous County, Laibin City, Guangxi*	KIZ20051015042	MG238231	Cyt <i>b</i>	This study
2	<i>O. jinxiuensis</i> sp. nov.	Fenzhan Village, Jinxiu Town, Yao Autonomous County, Laibin City, Guangxi*	KIZ20051015043	MG238232, PV817810	Cyt <i>b</i> , COI	This study
3	<i>O. jinxiuensis</i> sp. nov.	Fenzhan Village, Jinxiu Town, Yao Autonomous County, Laibin City, Guangxi*	KIZ20051015058	PX252287, PV817809	Cyt <i>b</i> , COI	This study
4	<i>O. jinxiuensis</i> sp. nov.	Fenzhan Village, Jinxiu Town, Yao Autonomous County, Laibin City, Guangxi*	KIZ20051015059	JF340409, PV817808	Cyt <i>b</i> , COI	This study
5	<i>O. andongensis</i>	Andong Town, Xincheng County, Laibin City, Guangxi, China*	N/A	OR188128	Cyt <i>b</i>	Luo et al. 2024
6	<i>O. andongensis</i>	Andong Town, Xincheng County, Laibin City, Guangxi, China*	N/A	OR712240	Cyt <i>b</i>	Luo et al. 2024
7	<i>O. daguishanensis</i>	Guangxi Daguishan Crocodile Lizard National Reserve, Hezhou City, Guangxi, China*	DLN20240571	PQ738635	Cyt <i>b</i> , COI	Chen et al. 2025
8	<i>O. daguishanensis</i>	Guangxi Daguishan Crocodile Lizard National Reserve, Hezhou City, Guangxi, China*	DLN20240572	PQ738636	Cyt <i>b</i> , COI	Chen et al. 2025
9	<i>O. damingshanensis</i>	Leping Village, Guling Town, Mashan County, Nanning City, Guangxi, China*	GZNU20230216010	OQ754118	Cyt <i>b</i>	Yu et al. 2023
10	<i>O. damingshanensis</i>	Leping Village, Guling Town, Mashan County, Nanning City, Guangxi, China*	GZNU20230216011	OQ754117	Cyt <i>b</i>	Yu et al. 2023
11	<i>O. guananensis</i>	Changmei Town, Huanjiang County, Hechi City, Guangxi, China*	GZNU2020073102	NC073134	Mitochondria genome	Luo et al. 2023
12	<i>O. guananensis</i>	Changmei Town, Huanjiang County, Hechi City, Guangxi, China*	GZNU2020073102	ON116507	Mitochondria genome	Luo et al. 2023
13	<i>O. guidongensis</i>	Dabu Town, Yanshan District, Guilin City, Guangxi, China*	GZNU2020011501	ON116514	Mitochondria genome	Luo et al. 2023
14	<i>O. guidongensis</i>	Jianghua County, Yongzhou City, Hunan, China	GZNU20210609005	ON116517	Mitochondria genome	Luo et al. 2023
15	<i>O. guidongensis</i>	N/A	N/A	NC068250	Mitochondria genome	GenBank
16	<i>O. guilinensis</i>	Shigumen Village, Xingping Town, Yangshuo County, Guilin City, Guangxi, China*	N/A	MN239094	Cyt <i>b</i>	Huang et al. 2020
17	<i>O. luochengensis</i>	Tianhe Town, Luocheng County, Guilin City, Guangxi, China*	GZNU2020011502	NC073128	Mitochondria genome	Luo et al. 2023
18	<i>O. luochengensis</i>	Tianhe Town, Luocheng County, Guilin City, Guangxi, China*	GZNU2020011502	ON116495	Mitochondria genome	Luo et al. 2023
19	<i>O. platycephalus</i>	Shenzhen City, Guangdong, China	GZNU2020112501	ON116528	Mitochondria genome	Luo et al. 2023
20	<i>O. platycephalus</i>	Baiyun Mountain, Guangzhou City, Guangdong, China	GZNU20230405008	OR396957	Cyt <i>b</i>	Lan et al. 2024
21	<i>O. platycephalus</i>	Xiuren Town, Lipu City, Guilin City, Guangxi, China	IHCAS0301039	DQ105197	Cyt <i>b</i>	Tang et al. 2006
22	<i>O. polystigmus</i>	Dabu Town, Yanshan District, Guilin City, Guangxi, China*	DLN20240167	DLN20240167	Cyt <i>b</i>	This study
23	<i>O. polystigmus</i>	Qinglong Tan, Yangshuo County, Guilin City, Guangxi, China	DLN20250343	DLN20250343	Cyt <i>b</i>	This study
24	<i>O. qinae</i>	Gutingshan Forest Park, Yufeng District, Liuzhou City, Guangxi, China*	KIZ2024010565	KIZ2024010565	PV266529	Chen et al. 2025
25	<i>O. qinae</i>	Gutingshan Forest Park, Yufeng District, Liuzhou City, Guangxi, China*	KIZ2024010566	KIZ2024010566	PV266530	Chen et al. 2025
26	<i>O. yuedongensis</i>	Zhangshuping Village, Yunluo Town, Puning City, Guangdong, China	GZNU20230405001	OQ754110	Cyt <i>b</i>	Lan et al. 2024
27	<i>O. yuedongensis</i>	Jiaoqiu Village, Liangtian Town, Jiexi County, Guangdong, China	GZNU20230405002	OQ754111	Cyt <i>b</i>	Lan et al. 2024
28	<i>O. zhangi</i>	Hanshan Village, Xinye County, Yulin City, Guangxi, China*	NNNU2023100201	PP590242	Cyt <i>b</i>	Zhong et al. 2024
29	<i>O. zhangi</i>	Hanshan Village, Xinye County, Yulin City, Guangxi, China*	NNNU2023100203	PP601248	Cyt <i>b</i>	Zhong et al. 2024
30	<i>Guinemachilus bailianensis</i>	Bailian cave, Liuzhou City, Guangxi, China*	GZNU 2020041603	ON116504	Mitochondria genome	Luo et al. 2023
31	<i>Guinemachilus longibarbus</i>	Gaoling Town, Duan County, Guangxi, China*	GZNU 2020073104	ON116508	Mitochondria genome	Luo et al. 2023
32	<i>Karstsinnectes parva</i>	Ande Town, Jingxi City, Guangxi, China	Tissue ID: JTQ02	ON116520	Mitochondria genome	Luo et al. 2023
33	<i>Karstsinnectes anophthalmus</i>	Leiping Town, Daxin County, Guangxi, China*	GZNU 2019011210	ON116513	Mitochondria genome	Luo et al. 2023

ID	Species	Collection localities (* type localities)	Voucher numbers	GenBank accession numbers	Gene type	References
34	<i>Karstsinnectes acridorsalis</i>	Bamu Town, Tiane County, Guangxi, China*	Tissue ID: GZNU2020	ON116515	Mitochondria genome	Luo et al. 2023
35	<i>Lefua costata</i>	N/A	N/A	KT943751	Mitochondria genome	Luo et al. 2023
36	<i>Lefua nikkonis</i>	N/A	CBM: ZF 11290	NC027662	Mitochondria genome	Luo et al. 2023
37	<i>Lefua echigonia</i>	Hino, Shiga, Japan	N/A	NC004696	Mitochondria genome	Saitoh et al. 2002
38	<i>Micronemacheilus cruciatus</i>	N/A	CBM: ZF 12292	AP012142	Mitochondria genome	Miya et al. 2011
39	<i>Micronemacheilus pulcherrimus</i>	Duan County, Hechi City, Guangxi, China	GZNU 20210609004	ON116493	Mitochondria genome	Luo et al. 2023
40	<i>Paranemachilus jinxiensis</i>	Tiandong County of Guangxi, China	N/A	NC039380	Mitochondria genome	Huang et al. 2019
41	<i>Paranemachilus genilepis</i>	Fushui County, Guangxi, China	FSYT2019001)	MT845213	Mitochondria genome	Luo et al. 2020
42	<i>Paranemachilus zhengbaoshani</i>	Duan County, Guangxi, China	GZNU20210526001	ON116530	Mitochondria genome	Luo et al. 2023
43	<i>Paranemachilus pingguoensis</i>	Pingguo City, Guangxi, China*	PG20190701	MW043720	Mitochondria genome	Zhou et al. 2022
44	<i>Traccatichthys zispi</i>	Wangxia Town, Changjiang County, Hainan, China	Tissue ID: HN01	ON116518	Mitochondria genome	Luo et al. 2023
45	<i>Traccatichthys pulcher</i>	Leiping Town, Daxin County, Guangxi, China	Tissue ID: GX1	ON116516	Mitochondria genome	Luo et al. 2023
46	<i>Triplophysa panzhouensis</i>	Hongguo Town, Panzhou City, Guizhou Province, China*	GZNU20220513003	OQ754121	Cyt b	Luo et al. 2023
47	<i>Triplophysa macrocephala</i>	Lihu Town, Nandan County, Guangxi, China*	GZN20230404002	OQ754123	Cyt b	Luo et al. 2023
48	<i>Troglonectes macrolepis</i>	Dacai Town, Huanjiang County, Guangxi, China*	GZNU 2019122202	NC073129	Mitochondria genome	Luo et al. 2023
49	<i>Troglonectes furcocaudalis</i>	Yongle Town, Rongshui County, Guangxi, China*	GZNU2020042701	ON116512	Mitochondria genome	Luo et al. 2023
50	<i>Troglonectes microphthalmus</i>	Tianhe Town, Luocheng County, Guangxi, China*	GZNU2020041601	NC073127	Mitochondria genome	Luo et al. 2023
51	<i>Troglonectes shuilongensis</i>	Shuilong Town, Sandu County, Guizhou, China*	GZNU2019011201	NC073144	Mitochondria genome	Luo et al. 2023
52	<i>Yunnanilus pleurotaenia</i>	N/A	N/A	MW192447	Mitochondria genome	Cui et al. 2020
53	<i>Yunnanilus analis</i>	N/A	N/A	MW729320	Mitochondria genome	Qiu et al. 2021
54	<i>Yunnanilus jiuchiensis</i>	Jiuchi County, Penzhou City, Sichuan, China	N/A	MW532080	Mitochondria genome	Du et al. 2021

Result

Oreonectes jinxiuensis sp. nov.

<https://zoobank.org/7457019F-9401-45C0-AD06-6D0611C50F5E>

Oreonectes platycephalus, Zhu & Cao, 1987: 326 (Jinxiu County); Zhu 1989: 23–24, fig. 12 (Jiuxiu County); Du et al. 2008: 29–30, fig. 5 (Jiuxiu County).

Type material. Holotype. KIZ2005006221 (Kunming Natural History Museum of Zoology, KIZ, CAS), female, 48.9 mm standard length (SL), Fenzhan Village, Jinxiu Town, Yao Autonomous County, Laibin City, Guangxi Zhuang Autonomous Region, P.R. China; Liujiang River system of Pearl River basin; 24.120353°N, 110.214124°E. Collected by D.P. Kong and J. Yang on 15 October 2005.

Paratypes. KIZ2005006212, KIZ2005006219–220, KIZ2005006225–228, seven specimens, male, 40.1–

55.2 mm SL, KIZ2005006212, KIZ2005006229, female, 43.6–44.4 mm SL, same data as holotypes.

Other materials. KIZ 20051015021, KIZ 20051015042–44, same data as holotypes. KIZ 20051015058–59, Laoshan Farm, Jinxiu Town, Yao Autonomous County, Laibin City, Guangxi; 23.90017°N, 110.13207°E. Collected by D.P. Kong and J. Yang in 15 October 2005.

Etymology. The species name is derived from Jinxiu Town, Yao Autonomous County, Laibin City, Guangxi, where the specimens were collected. We suggest the Chinese common name as “金秀岭鳅.”

Diagnosis. Comparative data between *Oreonectes jinxiuensis* sp. nov. and all 12 known species within the genus *Oreonectes* are provided in Table 2. This new species can be distinguished from all known species of *Oreonectes* by a combination of the following characteristics: color pattern presence; swim bladder degenerated; anterior and posterior nostrils adjacent; dorsal-fin origin posterior to pelvic-fin origin; tip of pelvic fin not reach-

Table 2. Comparative data between *Oreonectes jinxiuensis* sp. nov. and 12 known species within the genus *Oreonectes*.

Species	Color pattern	Dorsal-fin rays	Pectoral-fin rays	Pelvic-fin rays	Caudal-fin rays	Lateral line pores	Tube connecting two chambers	Caudal fin	Swim bladder
<i>O. jinxiuensis</i> sp. nov.	Present	iv, 7	i, 10	i, 6	14–15	8–16	Short tube	Rounded	Degenerated
<i>O. andongensis</i>	Present	iii, 7	i, 9–10	i, 6	13–14	8–16	Short tube	Rounded	Developed
<i>O. daguishanensis</i>	Present	iii, 6–7	i, 7–9	i, 6–7	14	5–8	Short tube	Rounded	Degenerated
<i>O. damingshanensis</i>	Present	iii, 7	i, 9	i, 7	14	14–15	Long, slender tube	Rounded	Developed
<i>O. guananensis</i>	Present	iii, 7	i, 11–12	i, 7–8	14–15	7–13	Short tube	Rounded	Developed
<i>O. guidongensis</i>	Present	iii, 7	i, 10	i, 6	14–16	6–10	Long, slender tube	Rounded	Developed
<i>O. guilinensis</i>	Present	ii, 6	i, 9–10	i, 6–7	13–14	4–6	Long, slender tube	Rounded	Developed
<i>O. luochengensis</i>	Absent	iii, 7	i, 11–12	i, 7	14–16	6–13	Short tube	Truncated	Developed
<i>O. platycephalus</i>	Present	iii, 6	i, 10–11	i, 7	14–15	6–15	Unknown	Rounded	Degenerated
<i>O. polystigmus</i>	Present	iii, 7–8	i, 10	i, 6	14–15	6–8	Long, slender tube	Rounded	Developed
<i>O. qinae</i>	Present	iii, 6–7	i, 9–10	i, 6–7	16	12	Short tube	Rounded	Degenerated
<i>O. yuedongensis</i>	Present	iii, 6	i, 8–9	i, 6	13	6–8	Short tube	Rounded	Developed
<i>O. zhangji</i>	Present	iii, 7	i, 8–9	i, 6	15–16	7–13	Short tube	Rounded	Degenerated

ing anus; 10 branched pectoral-fin rays; 14–15 branched caudal-fin rays; caudal fin without irregular black markings; caudal fin rounded; maxillary barbel not reaching posterior margin of opercula; 13 inner-gill rakers on first gill arch.

Description. Morphometric and meristic data are given in Table 3. Body densely scaled include thorax and abdomen, body elongate and cylindrical (Fig. 1), body depth 15.4%–20.4% of SL, slight elevation of head-dorsal

junction, dorsal-fin origin closer to caudal-fin base than to posterior margin of opercula; head compressed, head width 65.6%–75.0% of HL, head height 46.2%–56.2% of HL; snout length shorter than postorbital length, snout length 33.1%–42.3% of HL; mouth subterminal; inferior, slightly arched; upper lip smooth, only corners of mouth with slight wrinkles, lower lip wrinkles clearly visible, middle of lower lip separated by a V-shaped media notch, black pigmentation on upper lip, processus dentiformis

Table 3. Morphometric and meristic data of *Oreonectes jinxiuensis* sp. nov.

Characters	Holotype (Female)	Paratypes (mean ± SD)	
		Females (N = 2)	Males (N = 7)
Total length (mm)	60.3	54.2–55.7 (54.9 ± 1.0)	50.0–68.7 (57.5 ± 5.6)
Standard length (mm)	48.9	43.6–44.5 (44.0 ± 0.6)	40.1–55.2 (46.0 ± 4.6)
Percentage of standard length (%)			
Deepest body depth	17.5	16.8–18.3 (17.6 ± 1.0)	15.3–20.3 (17.7 ± 1.5)
Body width	13.2	13.0–14.4 (13.7 ± 0.9)	12.9–16.0 (14.4 ± 1.2)
Head width	15.2	16.1–16.3 (16.2 ± 0.05)	15.4–17.0 (16.0 ± 0.5)
Head depth	11.2	11.2–11.7 (11.5 ± 0.3)	10.5–13.0 (11.5 ± 0.8)
Head length	23.2	23.4–23.9 (23.7 ± 0.4)	21.0–24.2 (22.7 ± 1.1)
Predorsal length	58.5	58.2–61.4 (59.8 ± 2.3)	57.8–61.6 (59.1 ± 0.9)
Preventral length	52.2	50.3–53.0 (51.7 ± 1.8)	50.5–53.1 (51.4 ± 0.9)
Preanal length	76.6	75.4–77.2 (76.3 ± 1.2)	73.6–77.3 (75.5 ± 1.4)
Preanus length	70.4	70.0–70.0 (70.0 ± 0.0)	66.0–71.2 (68.4 ± 1.8)
Pectoral-fin length	19.2	18.9–19.4 (19.1 ± 0.3)	18.1–21.6 (19.7 ± 1.4)
Distance between pectoral fin and pelvic fin	29.9	30.5–30.6 (30.5 ± 0.1)	28.1–32.0 (30.3 ± 1.3)
Pelvic-fin length	15.7	16.2–17.7 (17.0 ± 1.0)	15.6–18.7 (17.2 ± 1.1)
Distance between pelvic fin and anal fin	25.7	24.3–25.7 (25.0 ± 0.9)	24.1–27.7 (25.9 ± 1.2)
Caudal-peduncle length	13.5	13.9–14.6 (14.3 ± 0.5)	13.2–16.4 (14.7 ± 1.1)
Caudal-peduncle depth	13.4	14.1–14.7 (14.4 ± 0.4)	12.8–16.1 (14.5 ± 1.0)
Percentage of lateral head length (%)			
Eye diameter	17.7	19.1–19.9 (19.5 ± 0.6)	16.3–20.2 (18.0 ± 1.3)
Interorbital width	35.4	34.6–38.1 (36.3 ± 2.5)	34.1–37.0 (35.4 ± 1.1)
Postorbital length	47.5	47.0–47.7 (47.4 ± 0.4)	43.8–49.3 (47.0 ± 1.7)
Snout length	34.3	36.3–37.4 (36.9 ± 0.7)	33.1–42.2 (36.8 ± 3.2)
Percentage of caudal-peduncle length (%)			
Caudal-peduncle depth	99.6	100.4–101.2 (100.8 ± 0.5)	77.8–108.0 (99.9 ± 11.2)
Counts			
Dorsal-fin rays	iv, 7	iv, 7	iv, 7
Pectoral-fin rays	i, 10	i, 10	i, 10
Pelvic-fin rays	i, 6	i, 6	i, 6
Anal-fin rays	iii, 5	iii, 5	iii, 5
Branched caudal-fin rays	15	15	14–15

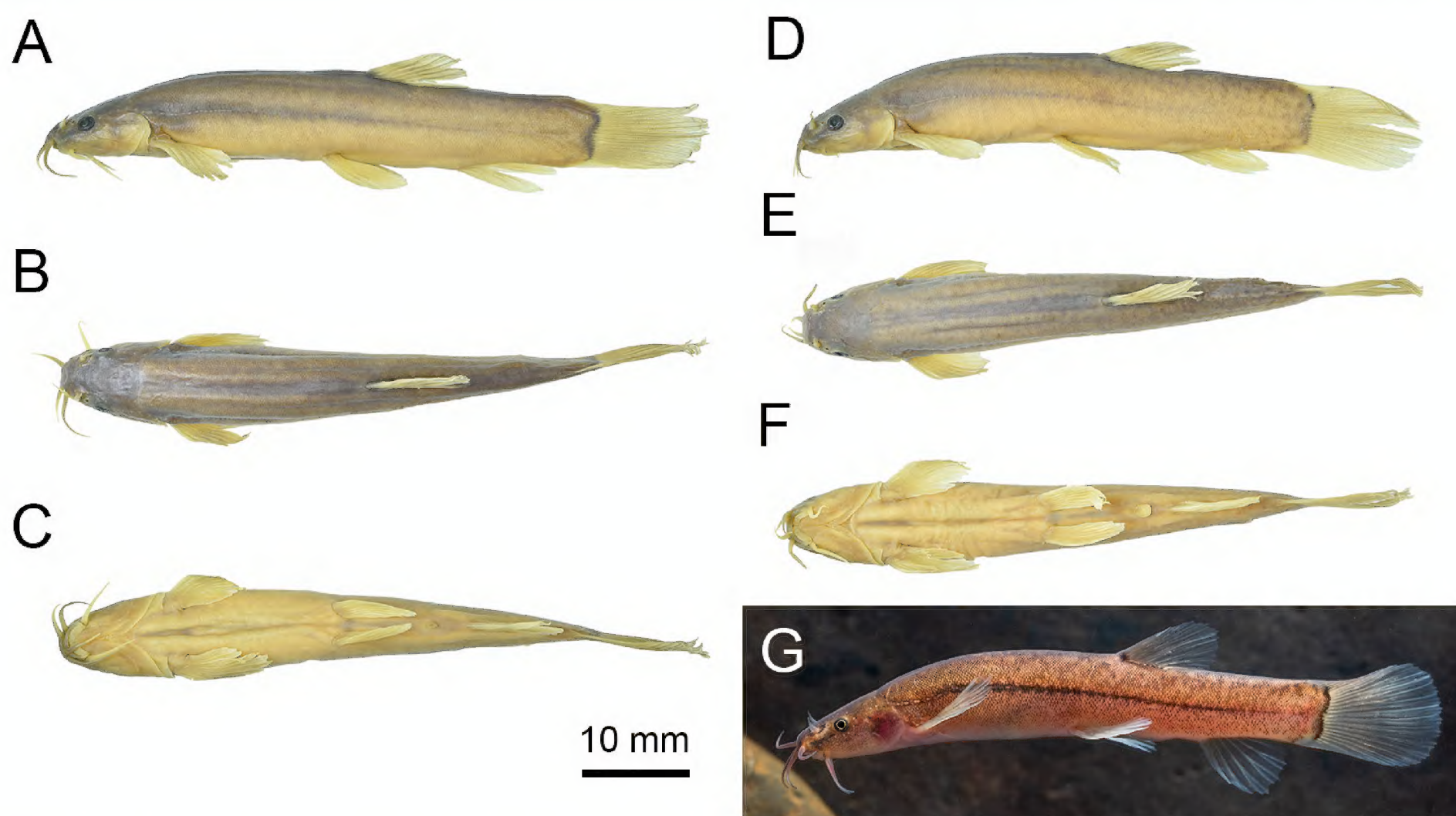


Figure 1. *Oreonectes jinxiuensis* sp. nov. A–C. Lateral, dorsal, and ventral views of the holotype KIZ2005006221 (♀); D–F. Lateral, dorsal, and ventral views of the paratype KIZ2005006226 (♂); G. Living photo of *Oreonectes jinxiuensis* sp. nov., taken by Liu Caixin.

absent; eyes normal, interorbital width greater than eye diameter; anterior and posterior nostrils adjacent, base of anterior nostril tubular, tip elongated to whisker-like; three pairs of barbels, inner rostral barbel reaching middle of eye; outer rostral barbel extending to posterior margin of eye; maxillary barbel extending to posterior margin of eye, not reaching posterior margin of opercula;

Four unbranched and seven branched dorsal-fin rays, one unbranched and 10 branched pectoral-fin rays; one unbranched and six branched pelvic-fin rays, three unbranched and five branched anal-fin rays, 14–15 branched caudal-fin rays. Dorsal fin origin posterior to pelvic-fin origin; pectoral fin length 58.5%–74.9% of distance between pectoral fin and pelvic fin; tip of pelvic fin close to but not reaching anus; pelvic fin length 58.6%–73.0% of distance between pelvic fin and anal fin; caudal-peduncle length similar to width, caudal-peduncle length 13.3%–16.4% of SL, caudal-peduncle depth 12.8%–16.1% of SL; caudal fin rounded, caudal fin without irregular black pigments.

Inner-gill rakers on first gill arch 12–13 (2); cephalic lateral line system well-developed, 7–9+3–4 infraorbital pores, 5–9 supraorbital canal pores, 3–4 supratemporal canal pores, 6–7 preoperculo-mandibular canal pores; lateral line incomplete, with 8–16 lateral-line pores.

Stomach U-shaped, intestine curved along stomach, leading directly to anus (Fig. 2A). Posterior chamber of swim bladder degenerated, only 1.6 times eye diameter, a short tube (less than half the length of posterior chamber) connected two chambers of swim bladder (Fig. 2B).

Sexual dimorphism. Mature males have genital papilla located immediately posterior to anus, gonad opens at the end of fleshy prominence (Fig. 1F), females do not have this characteristic.

Coloration. In life, body yellowish-brown, with a distinct black longitudinal stripe extending along the lateral line (Fig. 1G). In formalin-fixed specimens, body color faded, yet light yellowish brown and many obviously speckles, a longitudinal black stripe from dorsum of head to dorsal-fin base, the posterior margin of opercula has a longitudinal black stripe along the lateral line to anal fins, single dark brown vertical bar at caudal-fin base, all fins without speckles.

Distribution and habitat. *Oreonectes jinxiuensis* sp. nov. is currently known from Jinxiu Town, Yao Autonomous County, Laibin City (24.120353°N, 110.214124°E) (Fig. 3A), and Xiuren Town, Lipu City, Guilin (probably), Guangxi Zhuang Autonomous Region, China; mainly distributed in the Liujiang River system of the Pearl River basin in the Dayao Mountains area. This species inhabits small streamlets with water depths of about 0.5 m, characterized by abundant rocks and macrophytes around, providing good habitat for *Oreonectes jinxiuensis*.

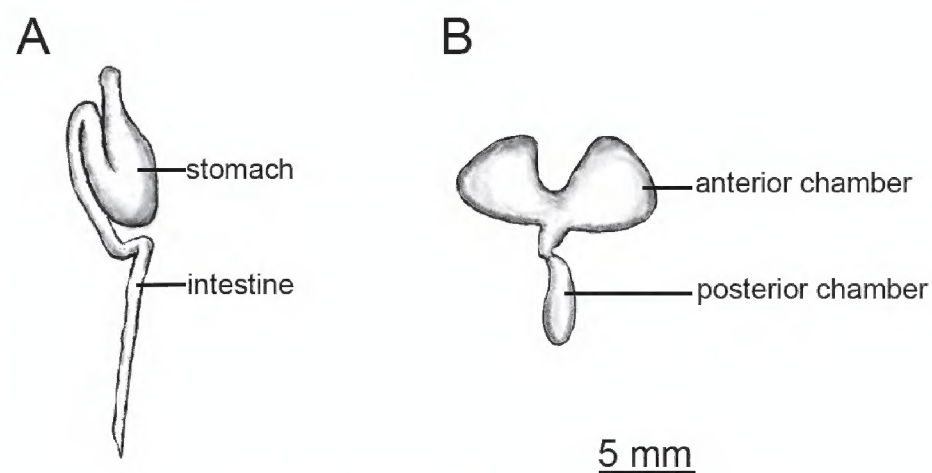


Figure 2. Morphological characteristics of the paratype KIZ2005006212 (♂) of *Oreonectes jinxiuensis* sp. nov. Stomach and intestine (A). Anterior and posterior chambers (B).

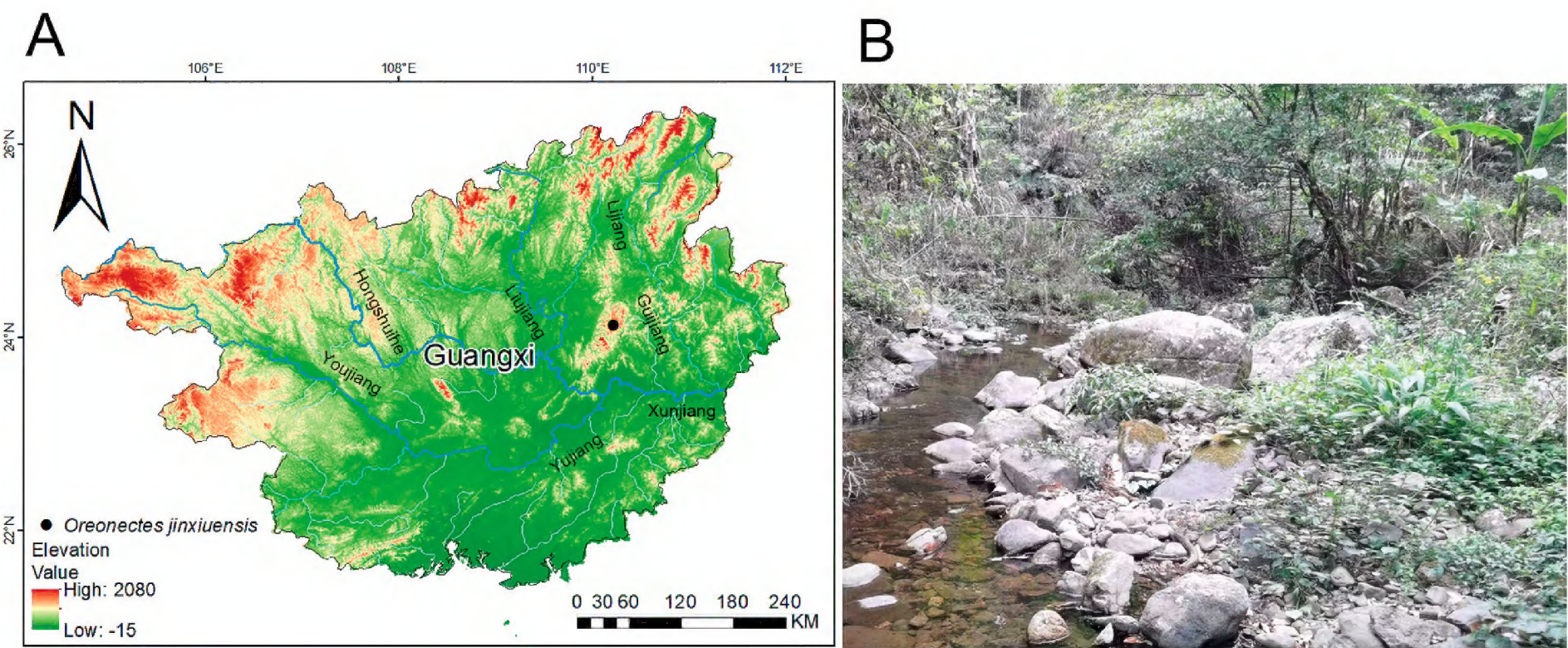


Figure 3. Distribution of *Oreonectes jinxiuensis* sp. nov. in Guangxi, China (A). Habitat photo of the type locality at the time of collection (B).

sp. nov. (Fig. 3B). Other species present in the streamlet include *Acrossocheilus parallens*, *Rhinogobius giurinus*, and *Opsariichthys bidens*.

Comparisons

Genetic comparisons. BI analysis of the constructed phylogenetic tree, based on a concatenated dataset of COI and Cyt *b* sequences, revealed consistent topologies. The phylogenetic tree confirmed the validity of the new species with high nodal support (BPP ≥ 0.95). Additionally, species within *Oreonectes* formed a monophyletic group, phylogenetically sister to the clade containing *Guinemachilus* and *Micronemacheilus*. *Oreonectes jinxiuensis* sp. nov. formed a highly supported clade with *O. guilinensis* and *O. platycephalus* (Fig. 4).

However, the *O. platycephalus* sequence **DQ105197** forms a distinct lineage separate from other *O. platycephalus* sequences in the phylogenetic tree. The taxonomic validity of this sequence requires further verification, and **DQ105197** was not included in this study’s sample and does not represent *O. platycephalus* discussed herein.

Genetic distances within the genus *Oreonectes* were calculated based on a concatenated dataset of mitochondrial COI and Cyt *b* (Table 4). The uncorrected *p*-distances between the new species and its congeners ranged from 4.1% (*O. guilinensis*) to 10.6% (*O. guananensis*), similar to values between other species in the same genus, such as 4.4% between *O. damingshanensis* and *O. zhang*i, 4.7% between *O. qinae* and *O. zhang*i, and 5.3% between *O. guananensis* and *O. luochengensis*. Despite the close phylogenetic position of *Oreonectes jinxiuensis* sp. nov. and *O. platycephalus* on the BI tree, the *p*-distance between them (calculated using sequences **ON116528** and **OR396957**, excluding **DQ105197**) was 7.8%. Substantial genetic divergence supports the conclusion that *Oreonectes jinxiuensis* sp. nov. represents a distinct species.

Morphological comparisons. Based on the results of PCA, two principal components of the morphological characters of *Oreonectes jinxiuensis* sp. nov. and *O. guilinensis* and *O. platycephalus*, which are phylogenetically close congeners of the new species, were extracted (Table 5). In the comparison between *O. jinxiuensis* sp. nov. and *O. guilinensis* and *O. platycephalus* (Fig. 5), the first principal component (PC1), which accounted for 39.6%

Table 4. Uncorrected *p*-distances (%) among 13 *Oreonectes* species based on a concatenated dataset of mitochondrial cytochrome c oxidase subunit I (COI) and cytochrome *b* (Cyt *b*) sequences.

ID	Species	1	2	3	4	5	6	7	8	9	10	11	12
1	<i>O. jinxiuensis</i> sp. nov.												
2	<i>O. andongensis</i>	8.5											
3	<i>O. daguishanensis</i>	8.8	6.9										
4	<i>O. damingshanensis</i>	7.8	6.9	6.7									
5	<i>O. guananensis</i>	10.6	8.8	10.5	9.8								
6	<i>O. guidongensis</i>	8.3	6.6	7.4	6.4	9.6							
7	<i>O. guilinensis</i>	4.1	8.1	8.5	7.9	10.1	8.3						
8	<i>O. luochengensis</i>	9.4	7.6	9.0	8.5	5.3	8.6	9.4					
9	<i>O. platycephalus</i>	7.8	7.6	7.8	7.8	7.3	10.0	7.2	9.3				
10	<i>O. polystigmus</i>	9.8	7.5	7.5	8.3	10.2	6.6	9.6	9.1	8.0			
11	<i>O. qinae</i>	7.4	6.1	6.5	1.4	9.8	6.5	7.6	8.4	7.2	8.4		
12	<i>O. yuedongensis</i>	6.1	6.2	6.5	6.4	7.8	5.8	5.6	7.3	5.0	7.6	5.9	
13	<i>O. zhang</i> i	7.5	7.4	6.6	4.4	10.1	6.7	7.7	8.0	7.5	8.0	4.7	6.1

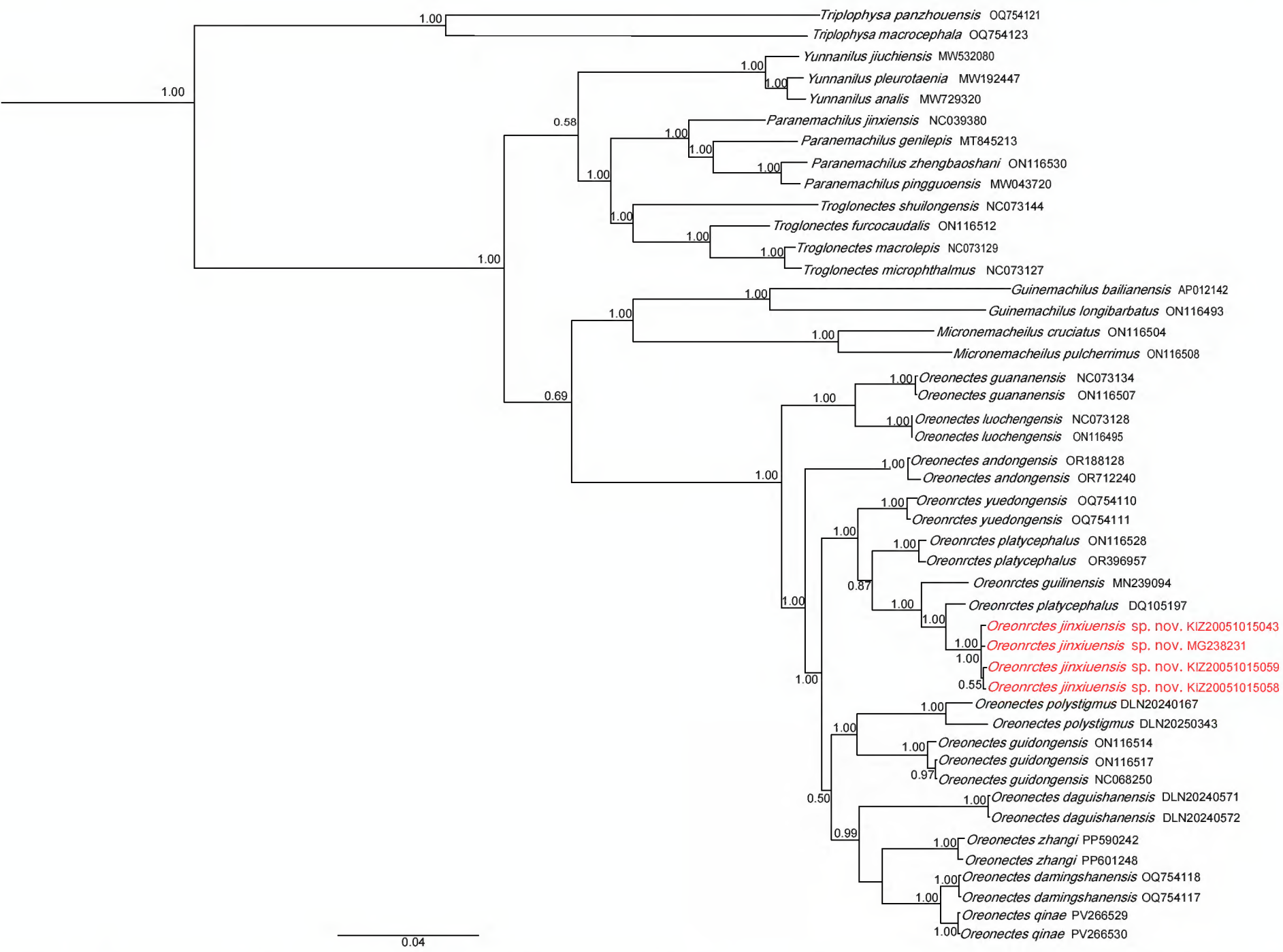


Figure 4. Bayesian phylogram of *Oreonectes* based on a concatenated dataset of mitochondrial cytochrome c oxidase subunit I (COI) and cytochrome *b* (Cyt *b*) sequences. Numbers on the branches represent BPPs from BI.

Table 5. Results and percentages of variance explained by principal component analysis (PCA).

Morphometric characters	PC1	PC2
Standard length	-0.273	0.269
Body depth/SL	-0.270	-0.146
Body width/SL	-0.338	0.017
Head length/SL	0.197	-0.133
Head depth/SL	-0.191	0.084
Head width/SL	0.161	0.190
Predorsal length/SL	0.303	0.116
Pectoral-fin length/SL	0.214	-0.228
Prepelvic length/SL	-0.137	0.275
Pelvic length/SL	0.305	-0.119
Preanal length/SL	0.114	0.370
Preanus length/SL	0.064	0.375
Caudal-peduncle length/SL	0.331	0.144
Caudal-peduncle depth/SL	-0.026	-0.419
Eye diameter/HL	0.116	-0.323
Interorbital width/HL	0.316	0.132
Snout length/HL	0.104	-0.080
Postorbital length/HL	0.171	0.275
Pelvic length/distance between pectoral fin and pelvic fin	0.321	-0.090
Eigenvalue	7.52	4.65
Variance (%)	39.5%	24.5%
Cumulative (%)	39.5%	64.1%

of the variance, was influenced by predorsal length, pelvic length, pectoral-fin length, caudal-peduncle length, interorbital length; the second principal component (PC2), which accounted for 24.5% of the variance, was influenced by standard length, prepelvic length, preanal length, preanus length, postorbital length.

Oreonectes jinxiuensis sp. nov. can be distinguished from *O. guilinensis* by swim bladder degenerated (vs. de-

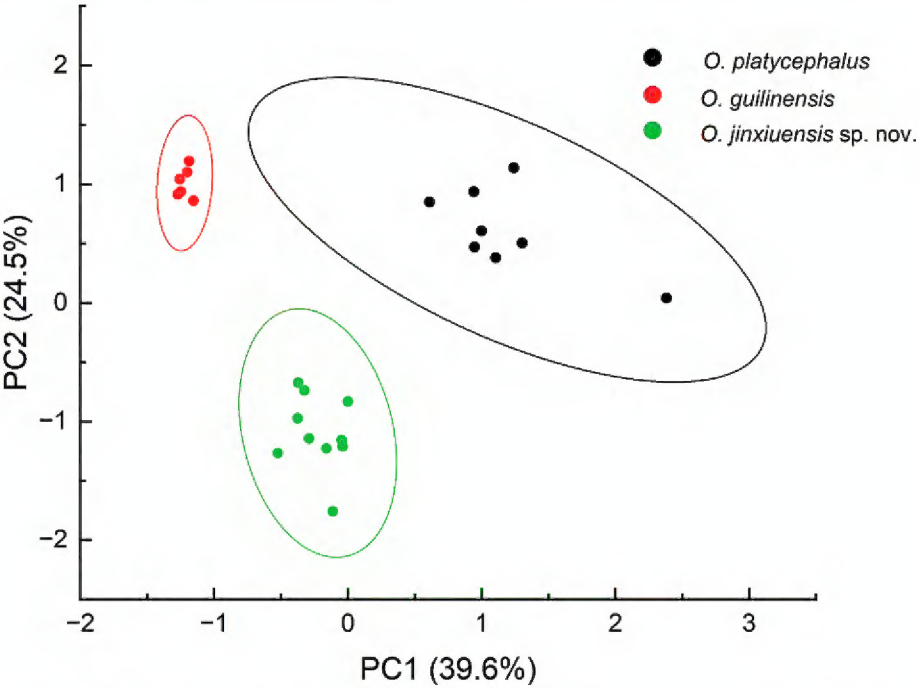


Figure 5. PCA plots of *Oreonectes jinxiuensis* sp. nov. and its close congeners *O. guilinensis* and *O. platycephalus* based on morphological characters.

veloped), 8–16 lateral-line pores (vs. 4–6), a short tube (less than half the length of posterior chamber) connected two chamber of swim bladder (vs. a long, slender tube, exceeding half the length of posterior chamber and nearly equal to its full length), four unbranched and seven branched dorsal-fin rays (vs. two unbranched and six branched dorsal-fin

rays), body width at front of dorsal fin 12.9%–16.0% of SL (vs. 16.8%–18.8%), body width at front of anal fin 5.8%–9.7% of SL (vs. 10.5%–12.3%), preanal length 73.7%–77.3% of SL (vs. 77.5%–78.8%), preanus length 66.1%–71.2% of SL (vs. 72.1%–73.0%), caudal-peduncle depth 12.5%–13.8% of SL (vs. 10.5%–11.5%), dorsal fin base to pelvic fin base 28.1%–32.0% of SL (vs. 33.0%–35.9%), pectoral fin length 18.1%–21.6% of SL (vs. 14.6%–16.6%), pelvic length 15.6%–18.7% of SL (vs. 11.5%–13.4%), eye diameter 16.4%–20.3% of HL (vs. 12.1%–16.1%).

Oreonectes jinxiuensis sp. nov. can be distinguished from *O. platycephalus* by four unbranched and seven branched dorsal-fin rays (vs. three unbranched and six branched dorsal-fin rays), six branched pelvic fin rays (vs. seven), a dark brown lateral stripe on both body sides presence (vs. absence), body width at front of dorsal fin 12.9%–16.0% of SL (vs. 5.7%–10.8%), head length 21.1%–24.3% of SL (vs. 15.5%–19.4%), caudal-peduncle length 13.3%–16.1% of SL (vs. 10.2%–12.9%), head width 15.3%–18.4% of SL (vs. 10.7%–13.4%). Morphological data of *O. platycephalus* following Ito (2024).

Oreonectes jinxiuensis sp. nov. formed a highly supported clade with *O. guilinensis* and *O. platycephalus*. Both *p*-distance and morphological data support the separation of the new species from these two species.

Key to species of the genus *Oreonectes*

- 1 Body color pattern absent, caudal fin truncated.....*O. luochengensis*
- Body color pattern present, caudal fin rounded..... 2
- 2 Dorsal fin origin opposite to pelvic-fin origin *O. guananensis*
- Dorsal fin origin posterior to pelvic-fin origin..... 3
- 3 Swim bladder developed..... 4
- Swim bladder degenerated..... 9
- 4 Tip of pelvic fin reaching anus..... 5
- Tip of pelvic fin not reaching anus..... 6
- 5 Maxillary barbel reaching the pectoral-fin origin, pectoral fin 13.0%–17.9% of SL..... *O. polystigmus*
- Maxillary barbel not reaching the pectoral-fin origin, pectoral fin 18.4%–20.1% of SL.....*O. yuedongensis*
- 6 Six branched dorsal-fin rays *O. guilinensis*
- Seven branched dorsal-fin rays 7
- 7 Six branched pelvic-fin rays 8
- Seven branched pelvic-fin rays..... *O. damingshanensis*
- 8 Eye diameter 19.5%–25.6% of HL, 11–12 inner gill rakers on first gill arch..... *O. andongensis*
- Eye diameter 10.1%–16.9% of HL, 10 inner gill rakers on first gill arch *O. guidongensis*
- 9 Absence of a dark brown lateral stripe on both body sides..... 10
- Presence of a dark brown lateral stripe on both body sides 11
- 10 Six branched dorsal-fin rays, 10–11 branched pectoral-fin rays *O. platycephalus*
- Seven branched dorsal-fin rays, eight to nine branched pectoral-fin rays*O. zhangji*
- 11 14–15 branched caudal-fin rays..... 12
- 16 branched caudal-fin rays *O. qinae*
- 12 Seven to nine branched pectoral-fin rays, 9–10 inner gill rakers on first gill arch..... *O. daguishanensis*
- 10 branched pectoral-fin rays, 13 inner gill rakers on first gill arch..... *O. jinxiuensis* sp. nov.

Discussion

The distinct lineage of *Oreonectes jinxiuensis* sp. nov., evidenced by uncorrected *p*-distances of 3.7% from *O. guilin-*

ensis and 6.9% from *O. platycephalus*, together with distinct morphological traits, confirms its validity as a new species.

To date, 13 species within the genus *Oreonectes*, including the newly described species, have been recog-

nized. Within the genus, *O. daguishanensis*, *O. platycephalus*, *O. qinae*, *O. jinxiuensis* sp. nov., and *O. zhang*i are characterized by a degenerated swim bladder, whereas *O. andongensis*, *O. damingshanensis*, *O. guananensis*, *O. guilinensis*, *O. guidongensis*, *O. luochengensis*, *O. polystigmus*, and *O. yuedongensis* are characterized by a developed swim bladder.

Except for *O. guilinensis* and *O. platycephalus*, among species characterized by a degenerated swim bladder, *O. jinxiuensis* sp. nov. can be distinguished from *O. daguishanensis* by having 10 branched pectoral-fin rays (vs. 7–9) and 13 inner gill rakers on the first gill arch (vs. 9–10); from *O. qinae* by having 14–15 branched caudal-fin rays (vs. 16), 6–7 preoperculo-mandibular canal pores (vs. 9–10), and an interorbital width of 34.2%–38.2% of HL (vs. 38.9%–50.6%); and from *O. zhang*i by having 10 branched pectoral-fin rays (vs. 8–9), 13 inner gill rakers on the first gill arch (vs. nine), head length 21.1%–24.3% of SL (vs. 18.6%–20.2%), preanal length 73.7%–77.3% of SL (vs. 67.7%–72.1%), caudal-peduncle depth 12.8%–16.1% of SL (vs. 11.5%–12.5%), and a caudal-peduncle depth of 77.9%–108.1% of caudal-peduncle length (vs. 68.6%–76.5%).

Among species characterized by a developed swim bladder, *O. jinxiuensis* sp. nov. can be distinguished from *O. andongensis* by having 13 inner gill rakers on the first gill arch (vs. 11–12), a prepelvic length of 50.4%–53.2% of SL (vs. 54.0%–57.3%), a preanal length of 73.7%–77.3% of SL (vs. 78.9%–81.5%), a preanus length of 66.1%–71.2% of SL (vs. 72.5%–75.6%), head length 46.3%–56.3% of HL (vs. 56.4%–67.8%), head width 65.6%–75.0% of HL (vs. 79.0%–86.8%), and an interorbital width of 34.2%–38.2% of HL (vs. 47.0%–54.4%); from *O. damingshanensis* by having 10 branched pectoral-fin rays (vs. nine), six branched pelvic-fin rays (vs. seven), 13 inner gill rakers on the first gill arch (vs. nine), snout length 33.1%–42.3% of HL (vs. 20.9%–29.9%), and an interorbital width of 34.2%–38.2% of HL (vs. 39.6%–50.2%); from *O. guananensis* by having 10 branched pectoral-fin rays (vs. 11–12), a preanal length of 73.7%–77.3% of SL (vs. 78.5%–81.3%), a preanus length of 66.1%–71.2% of SL (vs. 71.6%–73.9%), head width 65.6%–75.0% of HL (vs. 76.2%–89.0%), and an interorbital width of 34.2%–38.2% of HL (vs. 47.4%–53.6%); from *O. luochengensis* by having 10 branched pectoral-fin rays (vs. 11–12), six branched pelvic-fin rays (vs. seven), a rounded caudal fin (vs. truncated), a preanal length of 73.7%–77.3% of SL (vs. 77.8%–81.1%), a caudal-peduncle length of 13.3%–16.5% of SL (vs. 11.5%–13.0%), and an interorbital width of 34.2%–38.2% of HL (vs. 40.0%–47.4%); from *O. polystigmus* by the tip of the pelvic fin not reaching the anus (vs. reaching) and the tip of the maxillary barbel extending to the posterior margin of the eye (vs. reaching the posterior margin of the pectoral fin); and from *O. yuedongensis* by having six branched dorsal-fin rays (vs. seven), 10 branched pectoral-fin rays (vs. 8–9), 14–15 branched caudal-fin rays (vs. 13), 13 inner gill rakers on the first gill arch (vs. 9–10),

snout length 33.1%–42.3% of HL (vs. 20.9%–30.1%), and the tip of the pelvic fin not reaching the anus (vs. reaching). All morphological characters and molecular evidence support the validity of the new species.

Due to the complex karst landscape, the presence of a complicated underground river system, and the connectivity of developed surface-water systems, dispersal and diversification of species within the genus *Oreonectes* are facilitated (Luo et al. 2024). Specimens collected not only from Jinxiu County but also from other localities are likely to have been misidentified as *O. platycephalus*, and the possibility that these records represent new species cannot be excluded. The *O. platycephalus* sequence (GenBank accession [DQ105197](#)), collected from Xiuren Town, Lipu City, by Tang et al. (2006), clustered separately from other *O. platycephalus* sequences in the phylogenetic tree. This raises questions regarding the accuracy of its taxonomic identification and highlights the need for further molecular and morphological evidence to determine its phylogenetic position accurately. Due to the highly conserved morphological characteristics of the genus *Oreonectes*, species are difficult to recognize in the field. Therefore, classification of species within the genus *Oreonectes* should be based on both morphological data and molecular evidence to better document and enrich species diversity within the genus.

Comparative material

All specimens for comparison are as follows:

Oreonectes andongensis, GXNU20220601, holotype, 60.1 mm SL, GXNU20220602–10, paratypes, 9 ex., 36.8–56.2 mm SL, Andong Town, Xincheng County, Laibin City, Hongshui River system, Guangxi.

Oreonectes damingshanensis, GZNU20230216001, holotype, 81.8 mm SL, GZNU20230216002–010, 52.5–70.7 mm SL, GZNU20230216012–013, 60.8–61.3 mm SL, GZNU20230216015, 52.8 mm SL, GZNU20230216016–20, 54.3–64.1 mm SL, GZNU20230216022–25, 46.2–48.9 mm SL, paratypes, 21 ex., Mashan Town, Nanning City, Guangxi.

Oreonectes daguishanensis, KIZ2024010554, holotype, 57.9 mm SL, KIZ2024010555–558, paratypes, 4 ex., 45.3–59.4 mm SL, Gandong station of Guangxi Daguisan Crocodile Lizard National Reserve, Hezhou City, Guangxi.

Oreonectes guananensis, KIZ2010003067, holotype, 72.9 mm SL, KIZ2010003068–072, paratypes, 5 ex., 50.6–71.9 mm SL, Guan'an Village, Changmei Town, Huanjiang County, Guangxi.

Oreonectes guilinensis, ASIZB208001, holotype, 73.9 mm SL, ASIZB208002–007, paratypes, 6 ex., 66.6–82.9 mm, Shigumen Village, Xingping Town, Yangshuo County, Guilin City, Guangxi.

Oreonectes guidongensis, morphological data refer to Liao et al. (2025).

- Oreonectes luochengensis*, KIZ2010003073, holotype, 71.5 mm SL, KIZ2010003074–077, KIZ2010003242–244, paratypes, 7 ex., 61.5–76.4 mm SL, Tianhe Town, Luocheng County, Guangxi.
- Oreonectes platycephalus*, GZNU20230701013, GZNU20230701015–21, 27.3–54.9 mm SL, morphological data refer to Ito (2024).
- Oreonectes polystigmus*, KIZ2001004626, holotype, 56.4 mm SL, KIZ2002004627–634, paratypes, 8 ex., 34.5–53.2 mm SL, Dabu Village, Guilin City, Guangxi.
- Oreonectes qinae*, KIZ202401059, holotype, 78.6 mm SL, KIZ2024010560–564, paratypes, 5 ex., 46.3–70.5 mm SL, Gutingshan Forest Park, Youfeng District, Liuzhou City, Guangxi.
- Oreonectes yuedongensis*, GZNU20230304001, 60.2 mm SL, GZNU20230304003–006, 54.3–42.5 mm SL, GZNU20230304008, 43.1 mm SL, GZNU20230325003, 42.8 mm SL, GZNU20230409001–002, 37.5–39.7 mm SL, paratypes, 9 ex., Puning Town, Jieyang City, Guangdong.
- Oreonectes zhangii*, NNNU2023100203, holotype, 60.9 mm SL, NNNU2023100207, 61.6 mm SL, NNNU2023100210, 67.3 mm SL, NNNU2023100212–13, 48.4–55.2 mm SL, paratypes, 4 ex., Xinye County, Yulin City, Guangxi.

Nomenclatural acts registration

The electronic version of this article in portable document format represents a published work according to the International Commission on Zoological Nomenclature (ICZN). Therefore, the new name contained in the electronic version is effectively published under the Code in the electronic edition alone (see Articles 8.5–8.6 of the Code). This published work and the nomenclatural acts it contains have been registered in ZooBank LSIDs (Life Science Identifiers) and can be resolved. The associated information can be viewed through any standard web browser by appending the LSID to the prefix <http://zoobank.org/>.

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